

CLAIMS

I claim:

1. A system for automatically providing combined digital data in a form integrated with at least one of flight tracks, noise events, and complaint data, the system comprising:

means for receiving flight track data;

means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data;

means for receiving at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data; and

means for applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event.

2. The system of claim 1, wherein said means for receiving flight track data comprises a multilateration system for determining aircraft flight track by multilaterating radio signals received from the aircraft.

3. The system of claim 1, wherein said means for receiving flight track data comprises a passive radar system.

4. The system of claim 1, wherein said means for receiving flight track data comprises an air traffic control radar.

5. The system of claim 1, wherein said means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises:

means for detecting altitude exceedance of a flight track from a predetermined flight path.

6. The system of claim 1, wherein said means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises:

means for detecting a long duration lateral exceedance of a flight track from a predetermined flight path for more than a predetermined period of time.

7. The system of claim 1, wherein said means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises:

means for detecting a short duration lateral exceedance of a flight track from a predetermined flight path for less than a predetermined period of time.

8. The system of claim 1, wherein said means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises:

means for detecting at least one of a speed or thrust exceedance of a flight track from a predetermined flight path.

9. The system of claim 1, wherein said means for applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event comprises means for applying the knowledge-based rules in real time to the event data.

10. The system of claim 1, wherein said means for applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event comprises means for post-processing the knowledge-based rules to stored event data.

11. The system of claim 1, wherein airport operations data comprises one or more of Runways and types of approaches in use; Runway category of operation, Category I, II, III; Runway visual range (visibility on each runway); Airports operating in instrument of visual conditions (IFR/VFR operations); NOTAMS in effect ("notices to airmen"); Status of radar services at the airport and other nearby airports; Runways that are closed; Portions of taxiways that are closed; Construction crews working at the airport; Average runway occupancy time by aircraft type; and Average taxi time by aircraft type.

12. A method for automatically providing combined digital data in a form integrated with at least one of flight tracks, noise events, and complaint data, the method comprising the steps of:

receiving flight track data,
comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data,

receiving at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data, and

applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event.

13. The method of claim 12, wherein the step of receiving flight track data comprises the step of multilaterating radio signals received from the aircraft to generate flight track data.

14. The method of claim 12, wherein the step of receiving flight track data comprises receiving flight track data from a passive radar system.

15. The method of claim 12, wherein the step of receiving flight track data comprises receiving flight track data from an air traffic control radar.

16. The method of claim 12, wherein the step of comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises the step of detecting altitude exceedance of a flight track from a predetermined flight path.

17. The method of claim 12, wherein the step of comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises the step of detecting a long duration lateral exceedance of a flight track from a predetermined flight path for more than a predetermined period of time.

18. The method of claim 12, wherein the step of comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises the step of detecting a short duration lateral exceedance of a flight track from a predetermined flight path for less than a predetermined period of time.

19. The method of claim 12, wherein the step of comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises the step of detecting at least one of a speed or thrust exceedance of a flight track from a predetermined flight path.

20. The method of claim 12, wherein the step of applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event comprises the step of applying the knowledge-based rules in real time to the event data.

21. The method of claim 12, wherein the step of applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event comprises the step of post-processing the knowledge-based rules to stored event data.

22. The method of claim 12, wherein airport operations data comprises one or more of Runways and types of approaches in use,

Runway category of operation, Category I, II, III, Runway visual range (visibility on each runway), Airports operating in instrument of visual conditions (IFR/VFR operations), NOTAMS in effect ("notices to airmen"), Status of radar services at the airport and other nearby airports, Runways that are closed, Portions of taxiways that are closed, Construction crews working at the airport, Average runway occupancy time by aircraft type, and Average taxi time by aircraft type.

23. A system for automatically providing combined digital data in a form integrated with at least one of flight tracks, noise events, and complaint data, the system comprising:

means for receiving flight track data;
means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data;
means for receiving at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data; and
means for correlating the event data to at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data.

24. The system of claim 23, wherein said means for receiving flight track data comprises a multilateration system for determining aircraft flight track by multilaterating radio signals received from the aircraft.

25. The system of claim 23, wherein said means for receiving flight track data comprises a passive radar system.

26. The system of claim 23, wherein said means for receiving flight track data comprises an air traffic control radar.

27. The system of claim 23, wherein said means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises:

means for detecting altitude exceedance of a flight track from a predetermined flight path.

28. The system of claim 23, wherein said means for comparing the flight track data to a set of predetermined parameters to

determine if an event has occurred and producing event data comprises:

means for detecting a long duration lateral exceedance of a flight track from a predetermined flight path for more than a predetermined period of time.

29. The system of claim 23, wherein said means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises:

means for detecting a short duration lateral exceedance of a flight track from a predetermined flight path for less than a predetermined period of time.

30. The system of claim 23, wherein said means for comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises:

means for detecting at least one of a speed or thrust exceedance of a flight track from a predetermined flight path.

31. The system of claim 23, wherein said means for applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event comprises means for applying the knowledge-based rules in real time to the event data.

32. The system of claim 23, wherein said means for applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event comprises means for post-processing the knowledge-based rules to stored event data.

33. The system of claim 23, wherein airport operations data comprises one or more of Runways and types of approaches in use; Runway category of operation, Category I, II, III; Runway visual range (visibility on each runway); Airports operating in instrument of visual conditions (IFR/VFR operations); NOTAMS in effect ("notices to airmen"); Status of radar services at the airport and other nearby airports; Runways that are closed; Portions of taxiways that are closed; Construction crews working at the airport; Average runway occupancy time by aircraft type; and Average taxi time by aircraft type.

34. A method for automatically providing combined digital data in a form integrated with at least one of flight tracks, noise events, and complaint data, the method comprising the steps of:

receiving flight track data,

comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data,

receiving at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data, and

correlating the event data to the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data.

35. The method of claim 34, wherein the step of receiving flight track data comprises the step of multilaterating radio signals received from the aircraft to generate flight track data.

36. The method of claim 34, wherein the step of receiving flight track data comprises receiving flight track data from a passive radar system.

37. The method of claim 34, wherein the step of receiving flight track data comprises receiving flight track data from an air traffic control radar.

38. The method of claim 34, wherein the step of comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises the step of detecting altitude exceedance of a flight track from a predetermined flight path.

39. The method of claim 34, wherein the step of comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises the step of detecting a long duration lateral exceedance of a flight track from a predetermined flight path for more than a predetermined period of time.

40. The method of claim 34, wherein the step of comparing the flight track data to a set of predetermined parameters to

determine if an event has occurred and producing event data comprises the step of detecting a short duration lateral exceedance of a flight track from a predetermined flight path for less than a predetermined period of time.

41. The method of claim 34, wherein the step of comparing the flight track data to a set of predetermined parameters to determine if an event has occurred and producing event data comprises the step of detecting at least one of a speed or thrust exceedance of a flight track from a predetermined flight path.

42. The method of claim 34, wherein the step of applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data to determine possible causes of the event comprises the step of applying the knowledge-based rules in real time to the event data.

43. The method of claim 34, wherein the step of applying knowledge-based rules to the event data and the at least one of ATIS, D-ATIS, AWOS, LLWAS, TCAS, ACARS and airport operations data

to determine possible causes of the event comprises the step of post-processing the knowledge-based rules to stored event data.

44. The method of claim 34, wherein airport operations data comprises one or more of Runways and types of approaches in use, Runway category of operation, Category I, II, III, Runway visual range (visibility on each runway), Airports operating in instrument of visual conditions (IFR/VFR operations), NOTAMS in effect ("notices to airmen"), Status of radar services at the airport and other nearby airports, Runways that are closed, Portions of taxiways that are closed, Construction crews working at the airport, Average runway occupancy time by aircraft type, and Average taxi time by aircraft type.